



3330 Cameron Park Drive, Ste 550  
Cameron Park, California 95682  
(530) 676-6004 ~ Fax: (530) 676-6005

March 15, 2004  
Project No. 2007-0057-01

Mr. Don Hwang  
Alameda County Health Care Services  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Alameda County  
MAR 18 2004  
Environmental Health

Re: Response to Alameda County Health Care Services's Letter, dated January 28, 2004,  
for USA Service Station No. 57, Located at 10700 MacArthur Boulevard, Oakland,  
California

Dear Mr. Hwang:

This letter was prepared by Stratus Environmental, Inc (Stratus), on behalf of USA Gasoline Corporation (USA), in response to a letter from Alameda County Health Care Services (ACHCS) dated January 28, 2004. Stratus submitted a *Work Plan for Monitoring Well Replacement* that proposed to, 1) remove the existing monitoring well network to accommodate proposed redevelopment of the subject site and adjacent shopping center, and 2) install replacement monitoring wells following completion of redevelopment construction activities. In response, ACHCS responded (letter dated January 28, 2004) requested an addendum to the Work Plan regarding the proposed construction and sampling of the proposed replacement monitoring wells.

The owner of the former USA station property and adjacent shopping center plans to redevelop both properties. Subsequent to submittal of the *Work Plan for Monitoring Well Replacement*, Stratus was informed that redevelopment activities have been rescheduled to begin in approximately 6 to 12 months. This timeframe provides a window of opportunity to initiate feasibility testing to evaluate, and possibly remediate, the soil and groundwater beneath the site.

Previous consultants for this site have proposed the use of Regenesys' Oxygen Releasing Compound® (ORC®) to reduce the concentrations of dissolved hydrocarbons beneath the site. Stratus believes the application of ORC® at this site is inappropriate for the current situation. Long-term monitoring will be required to verify the effectiveness of the ORC® on the dissolved hydrocarbon mass. Additional applications of ORC® might be necessary. However, redevelopment plans call for the construction of a retail shopping complex over the dissolved plume, effectively prohibiting installation of any wells to monitor the reduction of dissolved hydrocarbon concentrations, and also severely limiting

the possibility of introducing additional ORC<sup>®</sup> into the dissolved hydrocarbon mass in the future. Finally, ORC<sup>®</sup> would not be effective in reducing residual concentrations of hydrocarbons in vadose zone soil beneath the former dispenser islands and in the walls of the former UST pit.

Stratus has prepared a *Feasibility Test Work Plan* (attached) that proposes to evaluate dual phase extraction (DPE) to remove hydrocarbon mass from the soil and groundwater. If ACHCS approves the attached *Work Plan*, and if the test indicates that DPE is a viable remedial option for the site conditions and DPE is subsequently implemented at the site, Stratus believes that the remaining hydrocarbon mass can be removed from the groundwater and the vadose zone beneath the site prior to the start of redevelopment activities. Successful implementation of DPE may allow the site to be considered for closure prior to redevelopment, may negate the need for special anti-vapor intrusion design considerations for the new buildings, and may negate the need for replacement of the monitoring well network subsequent to completion of redevelopment construction activities.

Stratus requests that you review the attached *Feasibility Test Work Plan* at your earliest convenience. If you have questions or concerns we would be happy to meet with you at your office to discuss them and work them out. If the *Work Plan* is approved, Stratus will implement the proposed scope of work immediately.

In the meantime, we also request that you suspend your request for an addendum to the *Work Plan for Monitoring Well Replacement* until the feasibility test can be implemented. If DPE successfully reduces hydrocarbons to acceptable levels, Stratus will request the site be reviewed for closure, and the replacement monitoring wells will not need to be installed. If DPE is not found to be a viable option, Stratus will submit the requested *Addendum* in anticipation of having to re-install the monitoring wells after redevelopment is completed.

Stratus has requested details regarding the final grading elevations and foundation/slab design details for the proposed buildings. To date these have not been completed. Upon receipt of this information from the developer, Stratus will forward this information to ACHCS.

## **SCHEDULE**

A report for the fourth quarter 2003 monitoring and sampling event was submitted to ACHCS on January 12, 2004. We submit the attached *Feasibility Test Work Plan* in lieu of the requested work plan addendum (due by March 28, 2004). If approved, the DPE feasibility test will be implemented and a report submitted to ACHCS according to the schedule presented in the *Feasibility Test Work Plan*.

Mr. Don Hwang, ACEHS  
Response to ACEHS letter of January 28, 2004  
USA Service Station No. 57  
Page 3

March 15, 2004  
Project No. 2007-0057-01

If you have any questions regarding this letter, or the attached *Feasibility Test Work Plan*, please call Steve Carter at (530) 676-6008.

Sincerely,

*STRATUS ENVIRONMENTAL, INC.*



Gowri S. Kowtha, P.E.  
Senior Engineer



Stephen J. Carter, R.G.  
Project Manger



Attachment: *Feasibility Test Work Plan* (dated March 15, 2004)

cc: Mr. Charles Miller, USA Corporation  
Mr. Ken Phares, Jay-Phares Corporation  
Mr. Peter McIntyre, AEI Consultants



3330 Cameron Park Drive, Ste 550  
Cameron Park, California 95682  
(530) 676-6004 - Fax: (530) 676-6005

March 15, 2004  
Project No. 2007-0057-01

Mr. Don Hwang  
Alameda County Health Care Services  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Subject: Feasibility Test Work Plan  
Former USA Station No. 57  
10700 MacArthur Boulevard  
Oakland, California

Dear Mr. Hwang:

On behalf of USA Gasoline Corporation (USA), Stratus Environmental, Inc. (Stratus) is submitting this *Feasibility Test Work Plan* to conduct dual-phase extraction (DPE) at the former USA Station No. 57, located at 10700 MacArthur Boulevard, Oakland, California.

The subject site and the adjacent shopping center are scheduled for redevelopment. The current schedule calls for construction to begin in approximately 6 to 12 months. During this period before the onset of construction activities, Stratus proposes to conduct a test to evaluate the feasibility of utilizing DPE to remove hydrocarbon mass from the vadose zone and groundwater beneath the former USA station. If the test data indicate that DPE is viable, Stratus proposes to utilize the DPE system to extract soil and groundwater for a period of approximately 30 days to remove residual hydrocarbon mass prior to site redevelopment.

## **SITE BACKGROUND**

The site is currently an undeveloped, partially paved parcel situated on the western corner of the intersection of 108<sup>th</sup> Avenue and Foothill Boulevard in Oakland, California, adjacent to Interstate 580 (Figure 1). This parcel comprises the southeastern corner of the Foothills Square Shopping Center. The investigation into environmental impact at this site included installation of eight groundwater monitoring wells (S-1, S-2, and MW-3 through MW-8) and twelve exploratory soil borings (A through D and B-1 through B-8). This work was completed between 1987 and 1995. The station was closed and the gasoline underground storage tanks (UST's) were removed in July 1994. Approximately 775 cubic yards of impacted soil was excavated from the vicinity of the UST pit and

product lines between August and October 1994. The approximate former locations of the UST's and dispenser islands are shown on Figure 2

## **SITE DESCRIPTION**

### **Geologic and Hydrogeologic Conditions**

Boring logs from subsurface investigations performed by others indicate from 10 to more than 40 feet of predominantly silty and clayey sand. A laterally continuous stratum of sandy and clayey gravel is encountered at approximately 25 feet below ground surface (bgs) beneath the northern portion of the site. Several lensoidal-shaped bodies (less than 5 feet thick and apparently without lateral continuity) are encountered in several borings. This sandy unit overlies bedrock consisting of deeply weathered, highly fractured silty sandstone and siltstone. Gravel-sized clasts were encountered within the bedrock unit in some of the borings.

Available potentiometric maps show flow towards the south, southeast, southwest, north, and radially inward towards a groundwater low around wells S-1, S-2, and MW-7. Historical groundwater elevation data back to 1995 (Appendix A) indicate that groundwater has fluctuated between approximately 7 and 21 feet bgs in the monitoring well network. During the most recent monitoring event (October 2003), groundwater was measured between 13.33 and 21.58 feet bgs. Historically, groundwater flow has been radial around wells S-1, S-2, and MW-7, and toward the north, south, southwest, and southeast.

### **Extent of Residual Impact in Vadose Zone Soil**

Based on our review of historical soil analytical data (Appendix B), petroleum hydrocarbons were reported in soil samples collected at the furthest extent of the former UST pit and beneath the former dispenser islands (refer to Figure 3). The former UST's, dispensers, and product lines were removed and impacted soil was excavated between July and October 1994. In the vicinity of the former UST pit, soil samples collected from 12 to 13 feet bgs on the western and southwestern pit walls contained up to 2,400 milligrams/kilogram (mg/Kg) of total petroleum hydrocarbons as gasoline (TPHG) and 9.6 mg/Kg of benzene. At the base of the former UST pit, TPHG and benzene were reported in soil samples collected from depths up to 20 feet bgs, at concentrations up to 620 and 1.1 mg/Kg, respectively.

TPHG and benzene were reported in five of the six soil samples collected beneath the former dispenser islands, at concentrations up to 1,800 and 0.72 mg/Kg, respectively. These samples were collected between 3 and 3.5 feet bgs. Additional excavation does not appear to have been performed in the area of the former dispenser islands. The former product lines ran from the former UST's along the southeastern end of the former dispenser islands. One sample from 3.5 feet bgs in the former product line trench

contained TPHG at a concentration of 4,500 mg/Kg, but limited excavation was performed in this area, and the concentration dropped to 15 mg/Kg at 9 feet bgs.

Near the former UST pit, soil samples collected from borings B-1 and MW-3 (west of the former UST pit) at depths between 10 and 21 feet bgs were reported to contain TPHG at concentrations up to 540 mg/Kg, with benzene concentrations up to 2.6 mg/Kg (refer to Figure 4). East of the former UST pit (boring B-2), TPHG was reported in soil samples collected between 16 and 26 feet bgs at concentrations of 16 to 240 mg/Kg. Benzene concentrations in these samples ranged from 0.057 to 0.96 mg/Kg. Soil analytical data from exploratory soil borings drilled adjacent to the former dispenser islands, former product line trench, and former UST pit (Appendix B) suggest that the lateral extent of impact near the former dispenser islands and former product line trench has been adequately characterized.

### **Extent of Dissolved Phase Hydrocarbons**

Within the existing monitoring well network, groundwater impact is limited to wells S-1, S-2, and MW-3 (refer to Figure 5). Currently (fourth quarter 2003, Appendix A), TPHG is reported in wells S-1 (390 micrograms/liter [ $\mu\text{g/L}$ ]) and S-2 (10,000  $\mu\text{g/L}$ ). Methyl tertiary butyl ether (MTBE) concentrations in these wells are reported at 8.8 and 180  $\mu\text{g/L}$ , respectively, and in Well MW-7 at 2.9  $\mu\text{g/L}$ . Benzene is only reported in well S-2 (39  $\mu\text{g/L}$ ). Well MW-3 has not been monitored and sampled since the fourth quarter 2000, but previously TPHG was consistently reported in this well between 1,000 and 14,000  $\mu\text{g/L}$ , and benzene between 120 to 5,400  $\mu\text{g/L}$ . MTBE by EPA Method 8020/8021B has also been reported in well MW-3 between 120 and 820  $\mu\text{g/L}$ , and one analysis by EPA Method 8260B reported MTBE at a concentration of 12  $\mu\text{g/L}$ . MTBE has been sporadically reported in well MW-7 by EPA Method 8020/8021B between 0.73 and 9.0  $\mu\text{g/L}$ , and by EPA Method 8260B between 1.8 and 3.8  $\mu\text{g/L}$ . Dissolved hydrocarbons are not detected in the other wells of the monitoring well network. These data suggest that the dissolved hydrocarbon plume is restricted to the vicinity of wells S-1, S-2, and MW-3.

### **PROPOSED SCOPE OF WORK AND RATIONALE**

Stratus proposes to perform a 6-day feasibility test to evaluate if DPE is a viable remedial option for site conditions. DPE technology involves concurrent extraction of groundwater and soil vapors from a common extraction well under vacuum conditions. DPE provides a means to accelerate removal of dissolved groundwater impact, remediate capillary fringe and smear zone soils, and facilitate removal of vadose zone soil impact.

The test will consist of extracting soil vapor and groundwater from wells S-1 and S-2. The DPE equipment will initially be connected to well S-1, and allowed to extract soil vapor and groundwater for 48 hours continuously. This procedure will then be repeated on well S-2. Finally, the procedure will be repeated while extracting from wells S-1 and

S-2 simultaneously. During extraction, Stratus will measure soil vapor and groundwater extraction rates per unit of applied vacuum at the wellhead, and the corresponding groundwater drawdown and induced vacuum at nearby wells. If field data from these tests indicate that the system is successfully removing hydrocarbons from the groundwater and affected vadose zone soils, the system will then be operated for a period of approximately 30 days to continue removing hydrocarbon mass.

Stratus will use a trailer-mounted DPE system during the test. The DPE system incorporates a liquid ring extraction pump capable of up to 25 inches of mercury vacuum and 500 cubic feet per minute (cfm) flow. The trailer-mounted unit also incorporates a thermal oxidizer, which will be used to abate the extracted soil vapors. The DPE system that Stratus plans to employ is permitted to operate at multiple locations by the Bay Area Air Quality Management District (BAAQMD). Extracted groundwater will be stored on-site in a 21,000-gallon storage tank. Stratus will submit a permit to the East Bay Municipal Utility District (EBMUD) to discharge the water (treated as required under the permit conditions) to the sewer system.

The proposed scope of work has been subdivided into four tasks, described below. The proposed scope of work will be performed under the supervision of a State of California Registered Geologist or Registered Civil Engineer.

### **Task 1 Prefield Activities**

#### Permit to Operate

Stratus will provide written notification to BAAQMD and ACHCS regarding the test schedule and duration.

#### Groundwater Discharge Permit

Stratus will submit a permit application to discharge the treated groundwater to the EBMUD sewer system. If the EBMUD does not permit discharge of the extracted water to their system, Stratus will retain a licensed contractor to transport and dispose of the water at an appropriate facility.

### **Task 2 Dual Phase Extraction Test**

Stratus proposes to initiate the DPE test by extracting from well S-2, where the highest concentrations of dissolved TPHG, benzene, and MTBE have historically been observed. After approximately 48 hours of continuous operation, the extraction procedure will be repeated on well S-1. After approximately 48 hours of continuous operation on well S-1, the wellheads of S-1 and S-2 will be plumbed together, and the extraction procedure will be repeated on the combined wells. The wellheads of wells S-1 and S-2 will be

temporarily modified to conduct the DPE test. The current depth to water in the proposed extraction wells is approximately 20 to 21.5 feet bgs (Appendix A).

Stratus will utilize the drop-tube entrainment method for DPE extraction. The drop-tube system is constructed by inserting a suction tube (pipe) into a sealed wellhead of the extraction well. Soil vapor and groundwater are transported through the drop-tube to an air-water separator (knock out tank), from which the vapors are routed to the thermal oxidizer and groundwater to a storage tank.

#### DPE Test Procedure

The DPE test will be initiated by setting the drop tube approximately 1 foot below groundwater and then slowly lowered to approximately 5 feet below static groundwater elevation, based on soil vapor and groundwater flow rates. Applied vacuum in the extraction well will be controlled to achieve approximately 1 gallon per minute (gpm) of groundwater extraction. Applied vacuum to the drop tube will be increased gradually to identify an optimum vacuum for groundwater drawdown and soil vapor extraction (applied vacuum not to exceed 18 inches of mercury [Hg] at the wellhead).

Given the extraction dynamics, maintaining a constant vacuum or extraction rate may be difficult. Additional time might be required if equipment or wellhead reconfiguration is required. Once an optimum vacuum has been identified, this vacuum will be held constant to conduct a long-term test. The optimum vacuum should be the most energy-efficient vacuum, beyond which excess vacuum would result in a diminishing rate of return (groundwater extraction and airflow rate).

Groundwater flow and soil vapor flow rates will be periodically recorded on field data sheets along with applied vacuum.

#### Observation Well Network

Wells not utilized for DPE extraction will be utilized as observation wells. Table 1 presents the screen intervals and total depths of wells installed at the site. The following parameters will be monitored during the test and recorded on field data sheets.

- Induced vacuum in observation wells,
- Groundwater elevation in observation wells,
- Wellhead vacuum,
- Vapor extraction rates, and
- Groundwater extraction rates.



Observation wellheads will be temporarily modified to monitor depth to water and induced vacuum. Dedicated magnahelic gauges will be placed on the wellheads to monitor induced vacuum during DPE. Changes in groundwater elevation will be periodically (every other hour or at significant changes in flow rate) monitored using a hand held water level indicator. A photoionization detector (PID) will also be used to monitor the concentration of volatile organic compounds in the extracted soil vapors.

Soil vapor and groundwater samples will be collected during the DPE test. Samples of the influent and effluent soil vapor and groundwater streams will be collected at the beginning and end of each test segment (at the beginning and end of extraction from well S-2, the beginning and end of extraction from well S-1, and the beginning and end of extraction from wells S-1 and S-2 combined). To evaluate the effectiveness of dissolved hydrocarbon removal from the water-bearing zone, the monitoring well network will be monitored and sampled before and after the DPE test. Proposed sample collection and analysis procedures are presented in Task 3.

### **Task 3 Sample Collection and Analysis**

Groundwater samples from the influent stream will be collected from a sample port located after the knockout tank. Effluent groundwater samples will be collected and analyzed as required for disposal under the EBMUD discharge permit. Vapor samples will be collected from influent and effluent sample ports on the thermal oxidizer.

Groundwater and soil vapor samples collected during the feasibility test will be forwarded to a state-certified laboratory to be analyzed for TPHG, benzene, toluene, ethylbenzene, and total xylenes (BTEX) isomers, five oxygenates (MTBE, tertiary amyl methyl ether [TAME], tertiary butyl alcohol [TBA], di-isopropyl ether [DIPE], and ethyl tertiary butyl ether [ETBE]), 1,2 dichloroethane (1,2-DCA), and ethylene dibromide (EDB) using USEPA Method SW8015B/DHS LUFT Manual and USEPA Method SW8260B. The samples will be submitted with the appropriate chain-of-custody documentation.

### **Task 4 Data Evaluation and Reporting**

If the field evidence suggests that DPE is effectively removing impacted groundwater and the vapor extraction radius of influence (ROI) is effectively covering the area of residual soil impact, Stratus will discuss with ACHCS the possibility of extending the DPE test beyond the initial testing period. Following completion of all field activities and receipt of all analytical data, Stratus will prepare and submit a report documenting the results of the feasibility testing. The report will include, at a minimum, the following items:

- Tabulated field data such as flow rates, dissolved oxygen, groundwater measurements and induced vacuums,

- Tabulated concentrations of petroleum hydrocarbons in extracted soil vapors and groundwater,
- Estimated mass extraction rates,
- Review of mass destruction rates,
- Induced vacuum versus flow rate graphs,
- Drawdown versus vacuum plots, and
- Estimated ROI.


## **SCHEDULE**


Stratus will submit permit applications to BAAQMD and EBMUD immediately upon ACHCS' approval of the *Feasibility Test Work Plan*. Assuming there are not complications in securing the permits, Stratus will initiate field activities within 30 working days of permit application submittal. Field activities for the initial test (extraction from well S-1, from well S-2, and from well S-1 and S-2 combined) are anticipated to take approximately 6 days. If field data and observations suggest DPE is feasible as a remedial option, and ACHCS approves, the field portion of the proposed work will extend for approximately 30 additional days. Within six weeks of completion of all field activities and receipt of all the analytical data, Stratus will submit the report of findings.

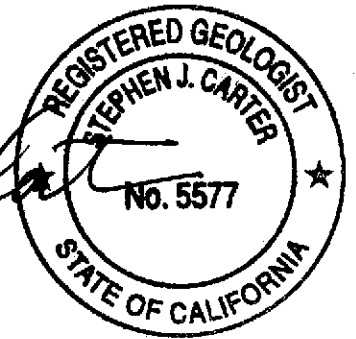
If you have any questions or comments concerning this *Work Plan*, please contact Steve Carter at (530) 676-6008.

Sincerely,

*STRATUS ENVIRONMENTAL, INC.*

  
Gowri S. Kowtha, P.E.  
Senior Engineer

  
Stephen J. Carter, R.G.  
Project Manager



Attachments: Table 1      Soil Boring and Well Construction Details  
                  Figure 1      Site Location Map  
                  Figure 2      Site Plan  
                  Figure 3      Soil Sampling Map  
                  Figure 4      Soil Concentration Map  
                  Figure 5      Groundwater Concentration Map  
                  Appendix A    Historical Groundwater Elevation and Analytical Data  
                  Appendix B    Historical Soil Analytical Data

cc: Mr. Charles Miller, USA Gasoline Corporation  
      Mr. Ken Phares, Jay-Phares Corporation  
      Mr. Peter McIntyre, AEI Consultants

**Table 1 - SOIL BORING AND WELL CONSTRUCTION DETAILS**

Former USA Station #57  
10700 MacArthur Boulevard  
Oakland, California

<b>ID</b>	<b>Date</b>	<b>Boring Dia. (inches)</b>	<b>Boring Depth (feet bgs)</b>	<b>Casing Diameter (inches)</b>	<b>Casing Depth (feet bgs)</b>	<b>Slot Size (inches)</b>	<b>Screen Interval (feet bgs)</b>
<b><u>Monitoring Wells</u></b>							
S-1	2/12/87	8	40	3	40	0.02	20 - 40
S-2	2/12/87	8	40	3	40	0.02	20 - 40
MW-3	2/28/95	10	44	4	44	0.02	24 -44
MW-4	11/20/95	10	40.5	4	40.5	0.02	10 - 40.5
MW-5	11/20/95	10	41	4	40	0.02	10 - 40
MW-6	11/20/95	10	40.5	4	40.5	0.02	10 - 40.5
MW-7	11/21/95	10	41	4	40	0.02	10 - 40
MW-8	11/21/95	10	35.5	4	35	0.02	10 - 35
<b><u>Soil Borings</u></b>							
A	2/12/87	8	20				
B	2/12/87	6	20				
C	2/12/87	6	20				
D	2/12/87	6	20				
B-1	2/28/95	8	46				
B-2	3/1/95	8	31				
B-3	3/1/95	8	21				
B-4	3/2/95	8	12				
B-5	3/2/95	8	12				
B-6	3/2/95	8	12				
B-7		(data not available)					
B-8	3/2/95	8	12				



GENERAL NOTES:  
 BASE MAP FROM U.S.G.S.  
 OAKLAND, CA  
 7.5 MINUTE TOPOGRAPHIC  
 PHOTOREVISED 1980



QUADRANGLE LOCATION



SCALE 1:24,000

**STRATUS**  
 ENVIRONMENTAL, INC.

FORMER USA STATION NO. 57  
 10500 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA  
 SITE LOCATION MAP

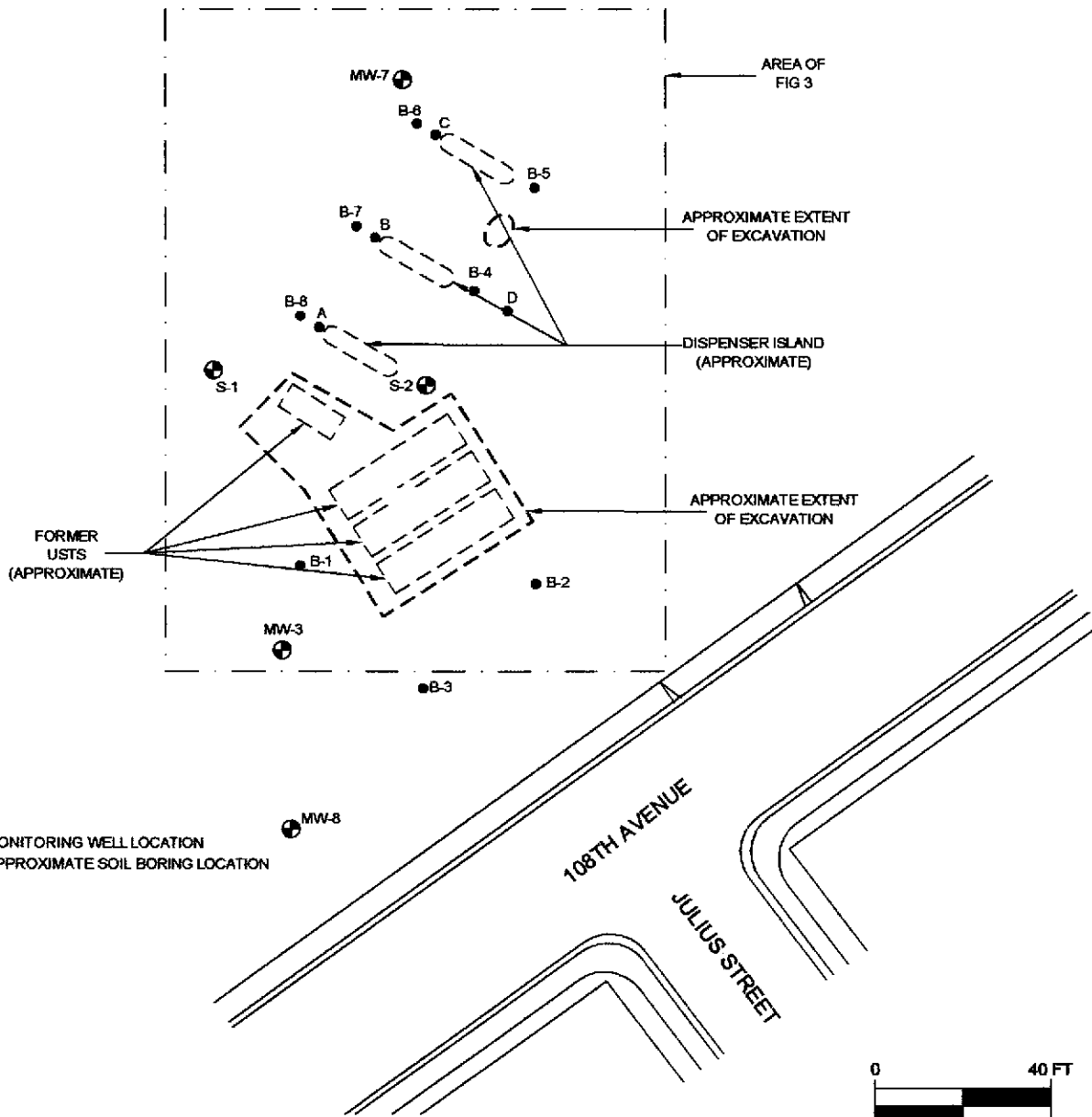
FIGURE  
**1**  
 PROJECT NO.  
 2007-0057-01



MW-5

MW-4

MW-6



LEGEND:

- ⊕ MW-3 MONITORING WELL LOCATION
- B-1 APPROXIMATE SOIL BORING LOCATION

NOTE: MAP BASES ON SURVEY PREPARED BY RON ARCHER CIVIL ENGINEER INC. (DATED NOVEMBER 22, 1995)  
 AND DRAWINGS PREPARED BY ALTON GEOSCIENCE AND WESTERN GEO-ENGINEERS.

USA 67 - 1981a  
 Mar 10, 2004  
 Rev.  
 JWP  
 USAS/Workshop

**STRATUS**  
 ENVIRONMENTAL, INC.

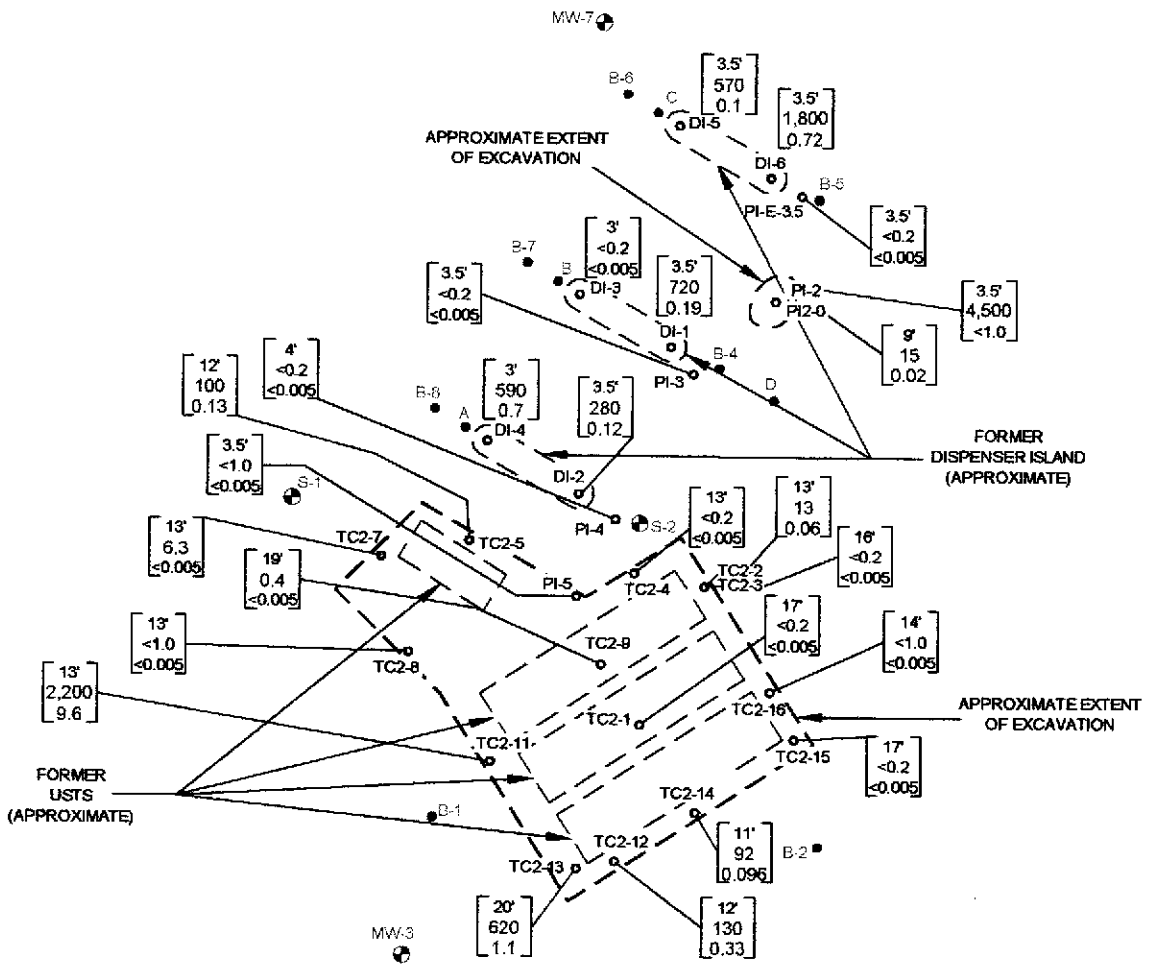
FORMER USA STATION #57  
 10700 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA

**SITE PLAN**

FIGURE

**2**

PROJECT NO.  
 2007-0057-01



**LEGEND:**

- MW-3 MONITORING WELL LOCATION
- B-1 APPROXIMATE SOIL BORING LOCATION
- D1-4 APPROXIMATE SOIL SAMPLE LOCATION

[ 17' ] DEPTH OF SAMPLE IN FEET bgs  
 <0.2 TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN mg/Kg  
 <0.005 BENZENE CONCENTRATION IN mg/Kg

SOIL SAMPLES COLLECTED BETWEEN 7/84 AND 9/94.  
 NOT ALL SAMPLE LOCATIONS SHOWN; ONLY THOSE SAMPLES  
 COLLECTED AT THE FURTHEST EXTENT OF EXCAVATION  
 MAP DOES NOT REFLECT OVER EXCAVATION AND SAMPLING  
 PERFORMED BY ALTON GEOSCIENCE IN 10/94.



SCALE

NOTE: MAP BASED ON SURVEY PREPARED BY RON ARCHER CIVIL ENGINEER INC. (DATED NOVEMBER 22, 1995) AND DRAWINGS PREPARED BY ALTON GEOSCIENCE AND WESTERN GEO-ENGINEERS.

**STRATUS**  
ENVIRONMENTAL, INC.

**FORMER USA STATION #57**  
10700 MACARTHUR BOULEVARD  
OAKLAND, CALIFORNIA

**SOIL SAMPLING MAP**

**FIGURE**

**3**

**PROJECT NO.**  
2007-0057-01

USA/ST/06/0001 Rev. Mar 16, 2004 J.M.P. USA/ST/06/0001



MW-5  
(NOT SAMPLED SINCE 3/12/02)

MW-4  
[ <50  
<0.50  
<0.50 ]

MW-6  
(NOT SAMPLED SINCE 8/10/88)

MW-7  
[ <50  
<0.50  
2.9 ]

S-1  
[ 390  
<0.50  
8.8 ]

S-2  
[ 10,000  
39  
180 ]

FORMER USTS  
(APPROXIMATE)

MW-3  
(NOT SAMPLED SINCE 10/19/00)

MW-8  
[ <50  
<0.50  
<0.50 ]

APPROXIMATE EXTENT OF EXCAVATION

FORMER DISPENSER ISLAND  
(APPROXIMATE)

APPROXIMATE EXTENT OF EXCAVATION

108TH AVENUE

JULIUS STREET

LEGEND:

MW-3 MONITORING WELL LOCATION

- [ <50 ] TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN µg/L
- [ <0.50 ] BENZENE CONCENTRATION IN µg/L
- [ <0.50 ] METHYL TERTIARY BUTYL ETHER CONCENTRATION IN µg/L

SAMPLES COLLECTED ON 10/09/03

TPHG ANALYZED BY EPA METHOD 8015B

BENZENE & MTBE ANALYZED BY EPA METHOD 8260B



SCALE

NOTE: MAP BASES ON SURVEY PREPARED BY RON ARCHER CIVIL ENGINEER INC. (DATED NOVEMBER 22, 1985) AND DRAWINGS PREPARED BY ALTON GEOSCIENCE AND WESTERN GEO-ENGINEERS.

**STRATUS**  
ENVIRONMENTAL, INC.

FORMER USA STATION #57  
10700 MACARTHUR BOULEVARD  
OAKLAND, CALIFORNIA  
GROUNDWATER CONCENTRATION MAP

FIGURE  
**5**  
PROJECT NO.  
2007-0057-01

USA 87 Quarry/07/04  
Mar 09, 2004  
Rev.  
JMP  
USA 57/07/04/01



**SUMMARY OF ANALYTICAL RESULTS**

**Soil Samples**

Boring No.	Depth (ft)	Total Hydrocarbons (ppm)
A	13.5-15	16
B	18.5-20	4
C	18.5-20	ND
D	9-10.5	2
S-1	19-20.5	42
S-1	19-20.5	16
S-2	24-24.5	600
Fill Box		410

**Ground-Water Samples**

Well No.	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)
S-1	630	4.4	37
S-2	3,400	3,800	11,000

*Handwritten note:*  
 610 Book  
 10/15  
 CHW  
 10/20

**QA/QC Water Samples**

Duplicate S-1	630	3.2	36
Field Blank	ND	ND	ND
Cleaning Blank	ND	2.3	5.2
Rinsate S-1	ND	ND	ND

**Note:** "ND" denotes concentration below detection limit (See Appendix B.)

**TABLE 1**

**GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY**

Former USA Station No. 57  
10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater							Total	
				Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	
S-1	03/03/95	13.10	74.74	61.64	910	5,900	260	7.6	15	14	NA	
	07/24/95	12.35		62.39	NA	NA	NA	NA	NA	NA	NA	
	11/22/95	19.30	78.68	59.38	460	6100	13	0.69	0.99	1.1	460*	
	12/06/95	19.59		59.09	NA	NA	NA	NA	NA	NA	NA	
	01/04/96	19.52		59.16	NA	NA	NA	NA	NA	NA	NA	
	01/31/97	15.07		63.61	1,100	200	11	6	3	6	200*	
	10/10/97	18.90		59.78	530	2,000	<0.5	2.1	<0.5	<2	230*	
	01/20/98	16.79		61.89	1,800	200	<0.5	<0.5	1.5	10	87*	
	04/28/98	8.37		70.31	130	7,300	1.9	3.2	<0.5	<0.5	310*	
	07/31/98	11.61		67.07	310	2,000	0.54	4.6	3.8	0.82	280*	
	11/02/98	15.28		63.40	1,000	1,200	<0.5	9.5	1.6	9.1	100	
	06/10/99	14.35		64.33	660	150	0.99	<0.5	<0.5	2.4	80*[1]	
	10/18/00	17.56		61.12	<50	330	<0.5	0.93	<0.5	<0.5	44	
	03/12/02	16.29		62.39	500	<50	2.8	4.8	0.79	4.4	63	
	11/19/02	19.53		59.15	190	NA	<0.50	<0.50	<0.50	<0.50	190	
	01/09/03	18.14		60.54	510	NA	1.1	<0.50	0.52	<0.50	11	
	04/14/03	18.04		60.64	300	NA	<1.0[2]	<1.0[2]	<1.0[2]	<1.0[2]	27	
	07/21/03	20.31		58.37	300	NA	<0.50	<0.50	<0.50	<0.50	11	
	10/09/03	19.46		59.22	390	NA	<0.50	<0.50	<0.50	<0.50	8.8	

TABLE 1

GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Groundwater		TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)
			Elevation (ft msl)	Elevation (ft msl)							
S-2	03/03/95	15.39	76.86	61.47	24,000	6,000	1,900	440	600	2,500	NA
	07/24/95	14.47		62.39	NA	NA	NA	NA	NA	NA	NA
	11/22/95	21.52	80.93	59.41	NA	NA	NA	NA	NA	NA	NA
	12/06/95	21.78		59.15	NA	NA	NA	NA	NA	NA	NA
	01/04/96	21.75		59.18	NA	NA	NA	NA	NA	NA	NA
	01/31/97	17.25		63.68	NA	NA	NA	NA	NA	NA	NA
	10/10/97	21.21		59.72	13,000	<50	260	38	190	280	600*
	01/20/98	19.07		61.86	1,900	2300	4.6	6.3	<0.5	4.6	190*
	04/28/98	10.47		70.46	22,000	<100	980	160	320	680	570*
	07/31/98	13.71		67.22	160,000	<50	950	290	550	1,700	550*
	11/02/98	17.31		63.62	14,000	<500	170	70	170	230	490*
	06/10/99	16.48		64.45	17,000	<50	650	230	<25	750	490*[1]
	10/18/00	19.70		61.23	4,400	<50	2	64	5.1	12	270
	03/12/02	18.56		62.37	5,100	660	62	44	52	78	430
	11/19/02	21.70		59.23	26,000	NA	1,400	180	520	340	750
	01/09/03	20.37		60.56	16,000	NA	120	32	76	214	270
	04/14/03	19.93		61.00	16,000	NA	160	76	210	290	400
	07/21/03	22.00		58.93	9,700	NA	270	90	200	277	410
	10/09/03	21.58		59.35	10,000	NA	39	9.2	52	26.5	180

**TABLE 1**

**GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY**

Former USA Station No. 57  
10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater							Total	
				Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	
MW-3	03/03/95	13.99	76.30	62.31	2,500	1,600	540	92	36	200	NA	
	07/24/95	13.33		62.97	NA	NA	NA	NA	NA	NA	NA	
	11/22/95	20.94	80.32	59.38	14,000	5,400	5,700	230	430	650	820*	
	12/06/95	17.48		62.84	NA	NA	NA	NA	NA	NA	NA	
	01/04/96	20.01		60.31	NA	NA	NA	NA	NA	NA	NA	
	01/31/97	16.63		63.69	1,100	<50	130	8	5	5	NA	
	10/10/97	20.62		59.70	3,400	1,100	830	4	100	<10	160*	
	01/20/98	15.40		64.92	3,900	550	7.9	4.1	<0.5	3.7	<5.0*	
	04/28/98	10.51		69.81	800	1,000	82	5.2	5.7	5.4	240*	
	07/31/98	13.46		66.86	2,200	610	510	7.6	16	5.27	310*	
	11/02/98	17.11		63.21	4,900	1,600	220	16	13	13.7	180*	
	06/10/99	15.24		65.08	1,000	120	<0.5	<0.5	<0.5	1.1	120*[1]	
	10/18/00	15.41		64.91	<50	<50	<0.5	<0.5	<0.5	<0.5	12	

Not Part of the Current Monitoring Well Network

**TABLE 1**

**GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY**

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total	
										Xylenes (µg/L)	MTBE (µg/L)
MW-4	11/22/95	14.99	76.42	61.43	<50	200	<0.5	1.5	<0.5	1.7	6.4*
	12/06/95	11.21		65.21	NA	NA	NA	NA	NA	NA	NA
	01/04/96	14.62		61.80	NA	NA	NA	NA	NA	NA	NA
	01/31/97	8.18		68.24	<50	<50	<0.5	2	<0.5	2	11*
	10/10/97	14.14		62.28	<50	<50	<0.5	<0.5	<0.5	<2	<5.0*
	01/20/98	7.05		69.37	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	04/28/98	5.88		70.54	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	07/31/98	8.40		68.02	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	11/02/98	16.08		60.34	NA	NA	NA	NA	NA	NA	NA
	06/10/99	14.81		61.61	NA	NA	NA	NA	NA	NA	NA
	10/18/00	12.71		63.71	<50	<50	<0.5	0.59	0.82	0.53	<5.0*
	03/12/02	8.92		67.50	<50	<50	<0.5	0.61	0.72	2.5	1.8
	11/19/02	13.24		63.18	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50
	01/09/03	11.00		65.42	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50
	04/14/03	11.03		65.39	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50
	07/21/03	13.10		63.32	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50
10/09/03	13.33		63.09	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50	

TABLE 1

GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater							Total	
				Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	
MW-5	11/22/95	19.56	80.52	60.96	<50	280	<0.5	1.8	<0.5	3	2.2*	
	12/06/95	15.84		64.68	NA	NA	NA	NA	NA	NA	NA	
	01/04/96	19.36		61.16	NA	NA	NA	NA	NA	NA	NA	
	01/31/97	13.31		67.21	80	<50	<0.5	0.6	<0.5	2	6*	
	10/10/97	17.80		62.72	<50	<50	<0.5	<0.5	<0.5	<2	<5*	
	01/20/98	12.58		67.94	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	04/28/98	9.45		71.07	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	07/31/98	7.38		73.14	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	11/02/98	15.98		64.54	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0*	
	06/10/99	14.60		65.92	NA	NA	NA	NA	NA	NA	NA	
	10/18/00	17.77		62.75	<50	<50	<0.5	0.75	<0.5	0.79	28	
	03/12/02	15.72		64.80	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	11/19/02	NM		NM								Well Damaged
	01/09/03	NM		NM								Well Damaged
	04/14/03	NM		NM								Well Damaged
	07/21/03	NM		NM								Well Damaged
10/09/03	NM		NM								Well Damaged	

TABLE 1

GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to	Well	Groundwater	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total	MTBE (µg/L)
		Water (feet)	Elevation (ft msl)	Elevation (ft msl)						Xylenes (µg/L)	
MW-6	11/22/95	21.73	81.64	59.91	<50	140	<0.5	1.2	<0.5	1.5	5.3*
	12/06/95	18.03		63.61	NA	NA	NA	NA	NA	NA	NA
	01/04/96	21.67		59.97	NA	NA	NA	NA	NA	NA	NA
	01/31/97	16.01		63.63	70	<50	<0.5	2	<0.5	<1	5*
	10/10/97	20.55		61.09	80	<50	<0.5	<0.5	<0.5	<2	<5*
	01/20/98	15.74		65.90	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	04/28/98	10.78		70.86	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	07/31/98	13.97		67.67	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	11/02/98	17.97		63.67	NA	NA	NA	NA	NA	NA	NA
	06/10/99	16.92		64.72	NA	NA	NA	NA	NA	NA	NA

Not Part of the Current Monitoring Well Network

**TABLE 1**

**GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY**

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total	
										Xylenes (µg/L)	MTBE (µg/L)
MW-7	11/22/95	19.38	78.86	59.48	<50	180	<0.5	0.57	<0.5	0.62	0.73*
	12/06/95	19.72		59.14	NA	NA	NA	NA	NA	NA	NA
	01/04/96	19.76		59.10	NA	NA	NA	NA	NA	NA	NA
	01/31/97	15.25		63.61	70	<50	0.7	1	<0.5	<1	8*
	10/10/97	19.03		59.83	<50	<50	<0.5	<0.5	<0.5	<2	15*
	01/20/98	17.11		61.75	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	04/28/98	8.22		70.64	<50	<50	<0.5	<0.5	<0.5	<0.5	9.3*
	07/31/98	11.53		67.33	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	11/02/98	15.15		63.71	NA	NA	NA	NA	NA	NA	NA
	06/10/99	14.23		64.63	NA	NA	NA	NA	NA	NA	NA
	10/18/00	17.59		61.27	NA	<50	<0.5	<0.5	<0.5	<0.5	<5.0*
	03/12/02	16.54		62.32	<50	<50	<0.5	<0.5	<0.5	<0.5	2.9
	11/19/02	19.59		59.27	<50	NA	<0.50	<0.50	<0.50	<0.50	3.8
	01/09/03	18.38		60.48	<50	NA	<0.50	<0.50	<0.50	<0.50	2.7
	04/14/03	18.17		60.69	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50
	07/21/03	20.29		58.57	<50	NA	<0.50	<0.50	<0.50	<0.50	1.8
	10/09/03	19.48		59.38	<50	NA	<0.50	<0.50	<0.50	<0.50	2.9



**TABLE 1**

**GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY**

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater							Total	
				Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	
MW-8	11/22/95	33.33	79.55	46.22	<50	360	<0.5	1.3	<0.5	2.1	2.1*	
	12/06/95	17.57		61.98	NA	NA	NA	NA	NA	NA	NA	
	01/04/96	20.08		59.47	NA	NA	NA	NA	NA	NA	NA	
	01/31/97	18.72		60.83	80	<50	0.6	1	<0.5	1	8*	
	10/10/97	20.26		59.29	50	<50	<0.5	<0.5	<0.5	<2	<5*	
	01/20/98	15.91		63.64	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	04/28/98	10.39		69.16	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	07/31/98	12.93		66.62	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0*	
	11/02/98	16.90		62.65	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0*	
	06/10/99	14.98		64.57	NA	NA	NA	NA	NA	NA	NA	
	10/18/00	16.27		63.28	<50	<50	<0.5	<0.5	1.1	6.3	8.6*	
	03/12/02	14.56		64.99	<50	<50	<0.5	0.63	0.55	1.7	0.94	
	11/19/02	21.14		58.41	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50	
	01/09/03	17.90		61.65	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50	
	04/14/03	17.84		61.71	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50	
	07/21/03	19.79		59.76	<100[2]	NA	<0.50	<0.50	<0.50	<0.50	<0.50	
	10/09/03	21.02		58.53	<50	NA	<0.50	<0.50	<0.50	<0.50	<0.50	

TABLE 1

GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY

Former USA Station No. 57

10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	Depth to Water (feet)	Well Elevation (ft msl)	Groundwater Elevation (ft msl)	TPHG (µg/L)	TPHD (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)
<p>Note:</p> <p>* = MTBE analyzed using EPA Method 8020/8021B</p> <p>[1] Laboratory indicates the chromatogram does not match the diesel hydrocarbon range pattern</p> <p>[2] Reporting limits were increased due to sample foaming</p> <p>[3] Reporting limits were increased due to high concentrations of target analytes</p> <p>MTBE = Methyl tert-butyl ether</p> <p>TPHD = Total petroleum hydrocarbons as diesel</p> <p>TPHG = Total petroleum hydrocarbons as gasoline</p> <p>TPHG analyzed using EPA Method 8015B and the remaining analytes using EPA Method 8260B</p> <p>Data prior to November 19, 2002 provided by GHH Engineering</p> <p style="text-align: right;">msl = Mean sea level µg/L = micrograms per liter NA = Not analyzed NM = Not measured</p>											

TABLE 2

GROUNDWATER ANALYTICAL RESULTS  
FOR OXYGENATES AND ADDITIONAL COMPOUNDS

Former USA Station No. 57  
10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
S-1	11/19/02	190	<10	<1.0	<1.0	<1.0	NA	NA
	01/09/03	11	<5.0	<1.0	<1.0	<1.0	NA	NA
	04/14/03	27	<20[2]	<2.0[2]	<2.0[2]	<2.0[2]	NA	NA
	07/21/03	11	<10[2]	<1.0	<1.0	<1.0	NA	NA
	10/09/03	8.8	6.4	<1.0	<1.0	<1.0	<1.0	<2.0
S-2	11/19/02	750	<200[1]	<20[1]	<20[1]	<20[1]	NA	NA
	01/09/03	270	<100[1]	<10[1]	<10[1]	<10[1]	NA	NA
	04/14/03	400	95	<5.0[1]	<5.0[1]	<5.0[1]	NA	NA
	07/21/03	410	110	<5.0[1]	<5.0[1]	<5.0[1]	NA	NA
	10/09/03	180	57	<5.0[1]	<5.0[1]	<5.0[1]	<5.0[1]	<20[1]
MW-4	11/19/02	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	01/09/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	04/14/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	07/21/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	10/09/03	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<2.0
MW-5	11/19/02				Well Damaged			
	01/09/03				Well Damaged			
	04/14/03				Well Damaged			
	07/21/03				Well Damaged			
	10/09/03				Well Damaged			

**TABLE 2**

**GROUNDWATER ANALYTICAL RESULTS  
FOR OXYGENATES AND ADDITIONAL COMPOUNDS**

Former USA Station No. 57  
10700 MacArthur Blvd., Oakland, California

Well Number	Date Collected	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-7	11/19/02	3.8	<5.0	<1.0	<1.0	<1.0	NA	NA
	01/09/03	2.7	<5.0	<1.0	<1.0	<1.0	NA	NA
	04/14/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	07/21/03	1.8	<5.0	<1.0	<1.0	<1.0	NA	NA
	10/09/03	2.9	<5.0	<1.0	<1.0	<1.0	<1.0	<2.0
MW-8	11/19/02	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	01/09/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	04/14/03	<0.50	<5.0	<1.0	<1.0	<1.0	NA	NA
	07/21/03	<0.50	<10[2]	<1.0	<1.0	<1.0	NA	NA
	10/09/03	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<2.0

Note:

Oxygenates analyzed using EPA Method 8260B

µg/L = micrograms per liter

NA = Not analyzed

[1] Reporting limits were increased due to high concentrations of target analytes

[2] Reporting limits were increased due to sample foaming

MTBE = Methyl tertiary butyl ether

TBA = Tertiary butyl alcohol

DIPE = Di-isopropyl ether

ETBE = Ethyl tertiary butyl ether

TAME = Tertiary amyl methyl ether

1,2-DCA = 1,2-Dichloroethane

EDB = 1,2-Dibromoethane

GROUNDWATER INORGANIC DATA  
 FORMER USA STATION #57  
 10700 MacARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA

Well ID	Date Sampled	pH (Units)	Specific Conductance (umhos/cm)	Total Alkalinity (mg/l)	Carbon Dioxide (mg/l)	Dissolved Oxygen (mg/l)	Phosphate (as P) (mg/l)	Ammonia (as N) (mg/l)	Nitrate (as N) (mg/l)	TKN (mg/l)	Redox Potential (Eh)	TDS (mg/l)
S-1	11/02/98	7.5	1188	608	84	1.9	0.51	2.12	1.50	2.40	+140	890
S-2	11/02/98	7.6	1140	590	88	2.2	0.14	2.40	1.80	2.70	+136	870
	06/10/99	6.9	1160	180	72	2.52	0.11	0.64	1.90	0.70	+101	790
MW-3	11/02/98	7.3	2770	640	98	2.6	0.25	4.70	1.40	5.30	+154	2110
MW-5	11/02/98	7.4	2930	100	96	6.5	0.31	1.48	9.40	1.70	+104	2200
	06/10/99	6.7	2780	640	84	3.36	0.10	0.75	6.90	0.82	+94	1980
MW-8	11/02/98	7.2	8923	140	102	7.0	0.32	4.20	3.60	4.70	+149	6300
Method No.		EPA 150.1	EPA 120.1	EPA 310.1	SM 4500	EPA 360.1	EPA 365.2	EPA 350.2	EPA 353.3	EPA 351.2	SM2580	EPA 160.1
Detection Limit		0.1	0.1	0.4	0.10	0.1	0.01	0.10	0.05	0.05	1	1.0

mg/l                      Milligrams per liter

TABLE 5

**SOIL ANALYTICAL DATA - TANK REMOVAL  
FORMER USA STATION #57  
10700 MacARTHUR BOULEVARD  
OAKLAND, CALIFORNIA**

Sample Location	Sample ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Total Xylene (ppm)	TLLC Lead (ppm)
Product Trench	PI-E-3.5	07/19/94	3.5	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	7
	PI-2	07/19/94	3.5	4,500	ND(50)	ND(1.0)	6	60	440	4
	PI-3	07/19/94	3.5	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	5
	PI-4	07/19/94	4	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	6
	PI-5	07/19/94	3.5	ND(1.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	7
	PI2-0	09/19/94	9	15	-	0.02	0.04	0.07	0.19	-
Tank Field	TP1	07/19/94	12.5	-	60	ND(0.005)	0.015	0.007	0.008	-
	TP2	07/19/94	12.5	-	230	ND(1.0)	0.79	2.2	0.7	-
	TP3	07/19/94	13	94	-	0.18	0.25	1	5.9	3
	TP4	07/19/94	13	1400	-	1.9	3.5	12	150	4
	TP5	07/19/94	13	300	-	ND(0.5)	0.74	4.8	20	3
	TP6	07/19/94	13	0.7	-	ND(0.005)	ND(0.005)	0.006	ND(0.005)	3
	TP7	07/19/94	13	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	3
Tank Cavity	TC-1	08/19/94	16	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC-2	08/19/94	16	93	-	ND(1.0)	0.28	0.63	3.1	-
	TC-3	08/19/94	17.5	2.4	1	0.008	0.02	0.02	0.11	-
	TC-4	08/19/94	15.5	0.7	2	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC-5	08/19/94	17	190	-	0.17	0.38	0.99	7.9	-
	TC-6	08/19/94	18	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	SM-1	08/19/94	19.5	0.4	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-1	09/27/94	417	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-2	09/27/94	13	13	-	0.06	0.019	0.026	ND(0.005)	-
	TC2-3	09/27/94	16	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-4	09/27/94	13	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-5	09/27/94	12	100	200	0.13	0.12	0.1	0.26	-
	TC2-7	09/27/94	13	6.3	37	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-8	09/27/94	13	ND(1.0)	16	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-9	09/27/94	19	0.4	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-11	09/27/94	13	2200	-	9.6	21	40	260	-
	TC2-12	09/27/94	12	130	-	0.33	0.29	0.66	7.9	-
	TC2-13	09/27/94	20	620	-	1.1	4.9	6.4	66	-
	TC2-14	09/27/94	11	92	-	0.096	0.1	0.17	1.7	-
	TC2-15	09/27/94	17	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
TC2-16	09/27/94	14	ND(1.0)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-	
(Alton)	TC3-3	10/94	12-13	300	330	-	-	-	-	-
(Alton)	TC3-4	10/94	12-13	510	ND	-	-	-	-	-
(Alton)	TCE-5	10/94	12-13	2400	ND	-	-	-	-	-
(Alton)	TC3-6	10/94	12-13	940	ND	-	-	-	-	-
Dispenser Island	DI-1	09/27/94	3.5	720	-	0.19	2	9	53	-
	DI-2	09/27/94	3.5	280	-	0.12	0.8	4.6	33	-
	DI-3	09/27/94	3	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	DI-4	09/27/94	3	590	-	0.7	2.5	13	81	-
	DI-5	09/27/94	3.5	570	-	0.1	1.5	2.7	17	-
	DI-6	09/27/94	3.5	1800	-	0.72	5.2	31	180	-

SOIL SAMPLES BY WESTERN GEO-ENGINEERS UNLESS OTHERWISE NOTED

TPH G Total petroleum hydrocarbons in the gasoline range

TPH D Total petroleum hydrocarbons in the diesel range

ppm Parts per million

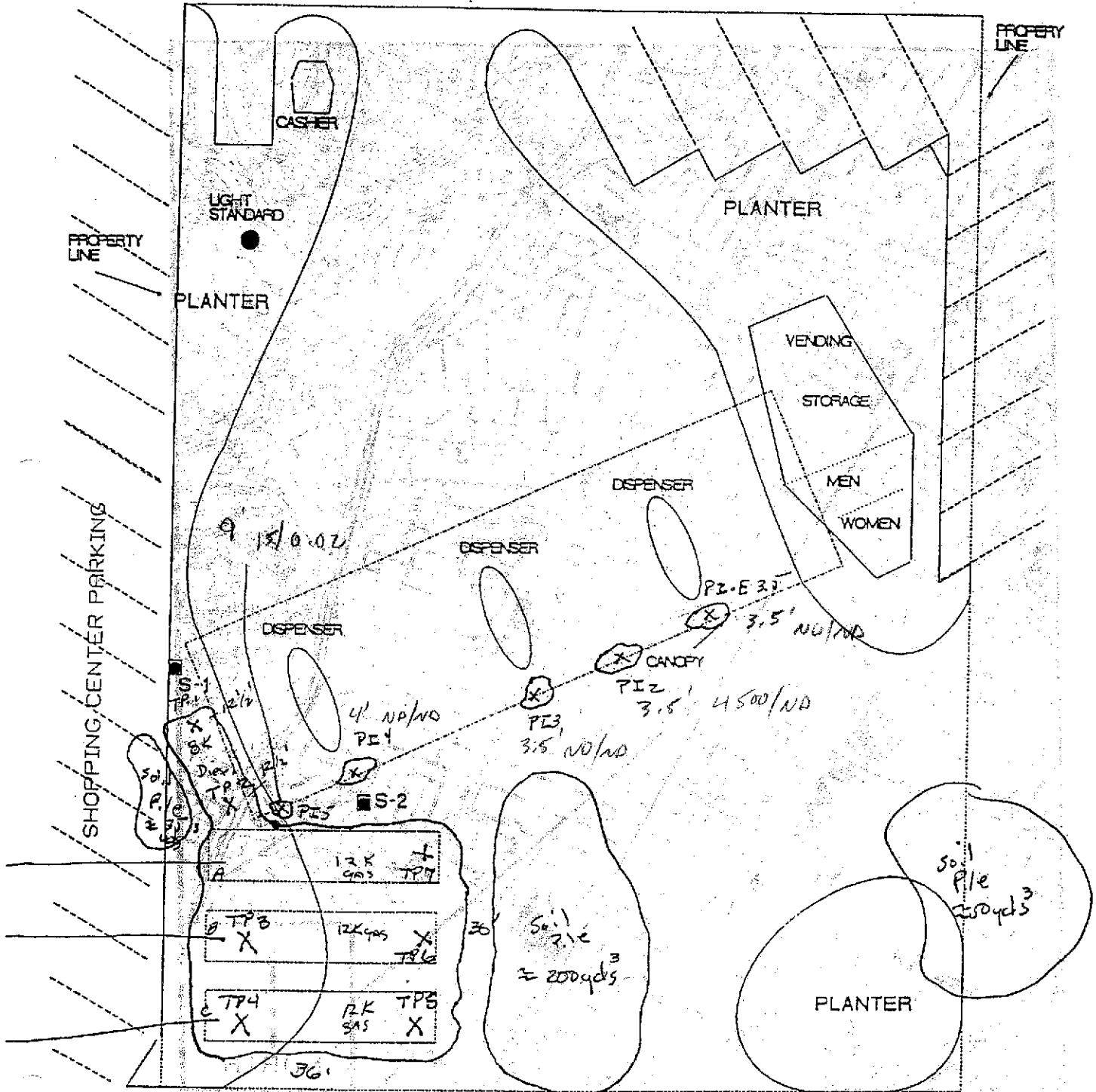
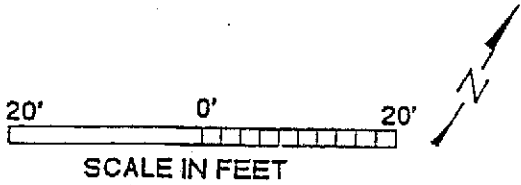
ND Not detected at the method detection limit

- Not measured/not analyzed

USTA AND PRODUCT LINE  
SOIL SAMPLING

USA GASOLINE CORPORATION  
STATION #57  
10700 MACARTHUR BLVD.,  
OAKLAND, CA  
SITE BASE MAP

FIGURE 3  
7/19/94

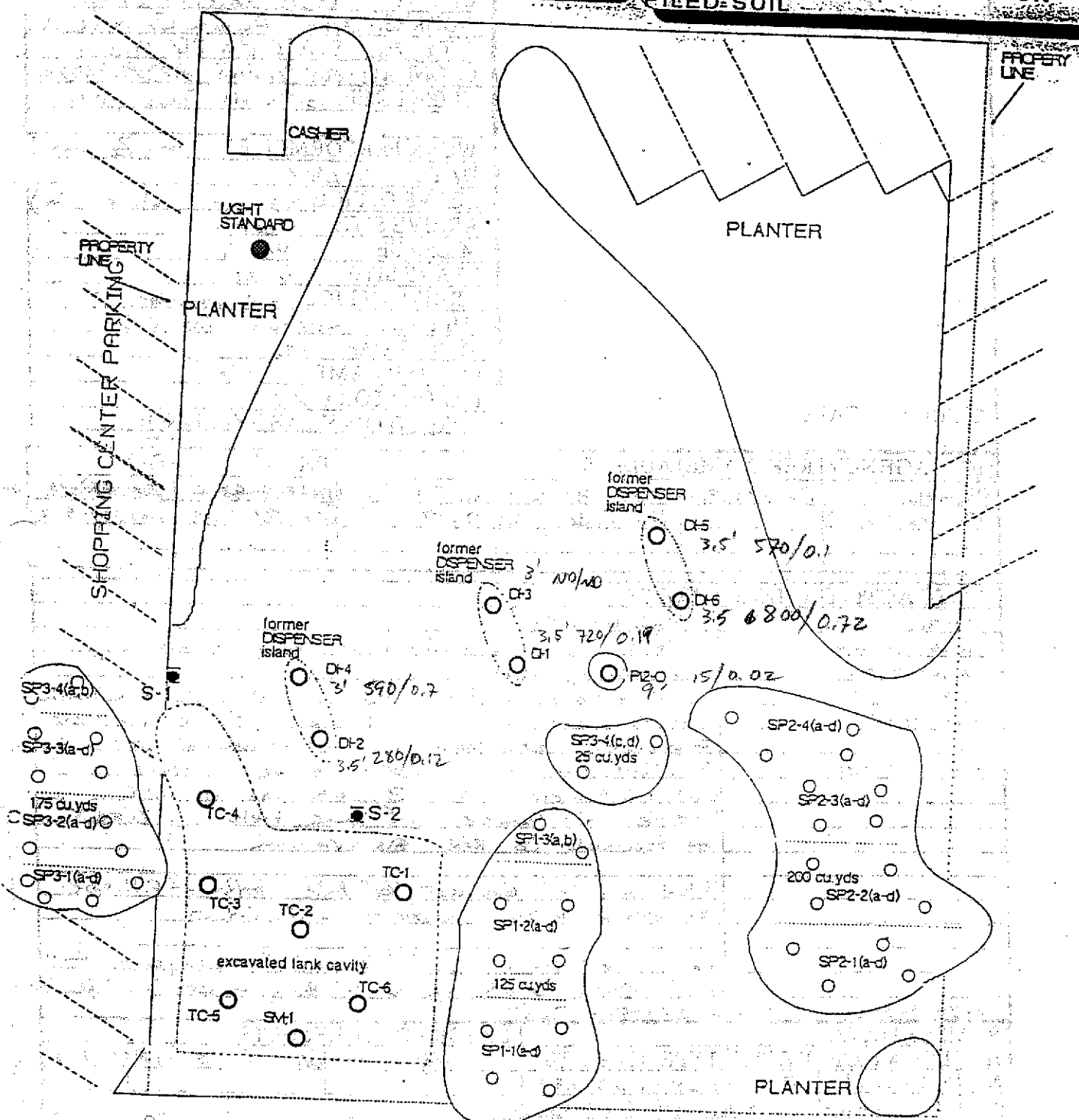
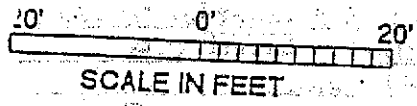


A pulled, clean intact - no holes  
- pulled 1/8" hole (fill side bottom) - taking water  
pulled, no holes intact

used M+H 4EL/O<sub>2</sub> meter to pull tanks  
perched water on site ~ 10% GW S<sub>1</sub> - 16'  
S<sub>2</sub> - 17'  
Analysis directed by Alameda Co. TP<sub>1</sub>, TP<sub>2</sub> TP<sub>4</sub>, D - BTRX 8200 PNA's

USA GASOLINE CORPORATION  
 STATION #57  
 10700 MACARTHUR BLVD.,  
 OAKLAND, CA  
**SOIL SAMPLING, TANK CAVITY,  
 DISPENSER ISLANDS & STOCK-  
 PILED SOIL**

**FIGURE 4**  
 8/19/94



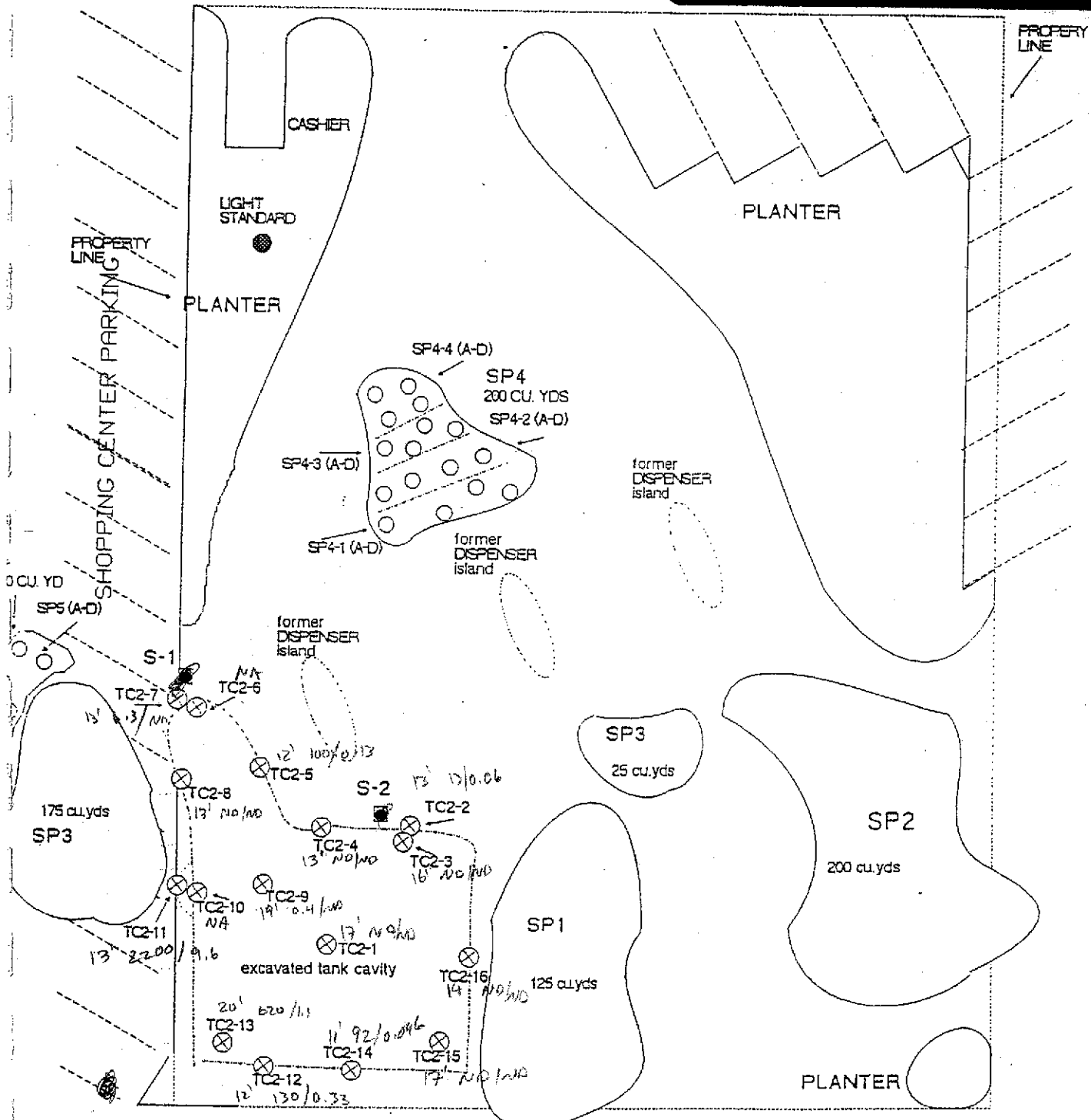
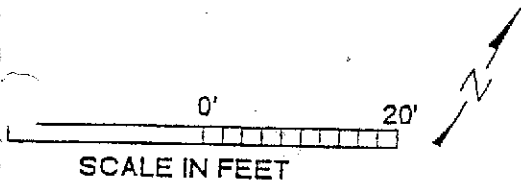
Depth(H) TPHG/Benzene in mg/L



USA GASOLINE CORPORATION  
 STATION #57  
 10700 MACARTHUR BLVD.,  
 OAKLAND, CA



FIGURE 5  
 9/27/94

SOIL SAMPLING, TANK CAVITY,  
 STOCK-PILED SOIL  
 (2nd EPISODE OF TNK CAV. SMPL)



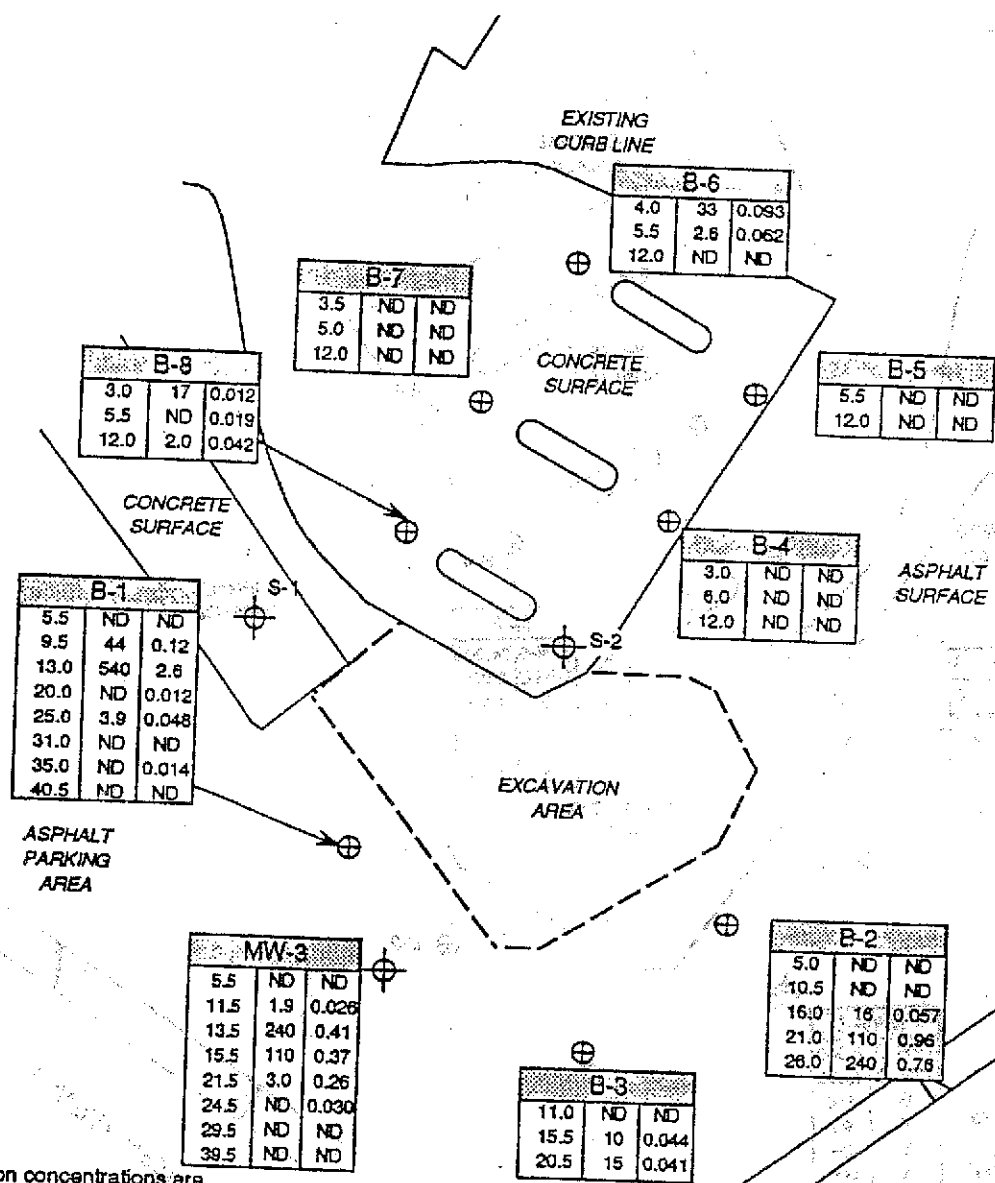
SAMPLES TAKEN FROM BASE OF TANK CAVITY	TC2-1 ✓	TC2-2 ✓	TC2-8 ✓	SAMPLES TAKEN FROM SIDEWALLS OF TANK CAVITY	SIDEWALL UNDERCUT-SAMPLES TAKEN
	TC2-9 ✓	TC2-3 ✓	TC2-11 ✓		
	TC2-13 ✓	TC2-4 ✓	TC2-12 ✓		
	TC2-15 ✓	TC2-5 ✓	TC2-14 ✓		
	TC2-7 ✓	TC2-16 ✓		TC2-6 AND TC2-10 TAKEN BUT NOT ANALYZED	

Depth (A) TPHG/Benzene in mg/L

 MW-3 Groundwater monitoring well  
 B-8 Soil boring  

MW-10		
Depth	TPH-G	B

 Hydrocarbon concentrations in soil (ppm). Depth in feet.



**B-1**

5.5	ND	ND
9.5	44	0.12
13.0	540	2.6
20.0	ND	0.012
25.0	3.9	0.048
31.0	ND	ND
35.0	ND	0.014
40.5	ND	ND

**B-7**

3.5	ND	ND
5.0	ND	ND
12.0	ND	ND

**B-8**

3.0	17	0.012
5.5	ND	0.019
12.0	2.0	0.042

**B-6**

4.0	33	0.093
5.5	2.6	0.062
12.0	ND	ND

**B-5**

5.5	ND	ND
12.0	ND	ND

**B-4**

3.0	ND	ND
6.0	ND	ND
12.0	ND	ND

**MW-3**

5.5	ND	ND
11.5	1.9	0.026
13.5	240	0.41
15.5	110	0.37
21.5	3.0	0.26
24.5	ND	0.030
29.5	ND	ND
39.5	ND	ND

**B-3**

11.0	ND	ND
15.5	10	0.044
20.5	15	0.041

**B-2**

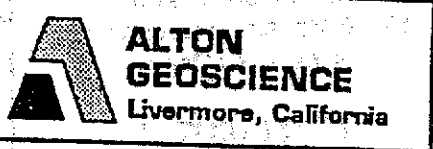
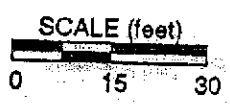
5.0	ND	ND
10.5	ND	ND
16.0	16	0.057
21.0	110	0.96
28.0	240	0.76

**NOTES:**  
 Hydrocarbon concentrations are based on results of laboratory analysis of soil samples collected February 28 through March 2, 1995. ND = not detected at detection limits stated in official laboratory reports. TPH-G = total petroleum hydrocarbons as gasoline; B = benzene; ppm = parts per million.

**HYDROCARBON CONCENTRATIONS IN SOIL**  
 February 28 through March 2, 1995

Former USA Gas #57  
 10700 MacArthur Boulevard  
 Oakland, California

**FIGURE 5**



N

MW-5	10.0'	15.0'
TPH-G	ND	ND
TPH-D	5.2	4.2
B	ND	ND
T	ND	ND
E	ND	ND
X	ND	ND

MW-8	Depth	Hydrocarbon concentrations in soil in ppm (Depth in feet)
TPH-G		
TPH-D		
B		
T		
E		
X		

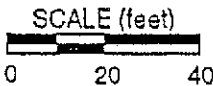
MW-4	10.0'
TPH-G	ND
TPH-D	5.0
B	ND
T	ND
E	ND
X	ND

MW-7	10.0'	15.0'	20.0'
TPH-G	ND	ND	25
TPH-D	4.7	4.3	8.7
B	ND	ND	0.071
T	ND	ND	0.11
E	ND	ND	0.043
X	ND	ND	0.10

MW-6	10.0'
TPH-G	ND
TPH-D	4.4
B	ND
T	ND
E	ND
X	ND

MW-8	10.0'	15.0'	20.0'
TPH-G	ND	ND	ND
TPH-D	5.5	5.1	4.5
B	ND	ND	ND
T	ND	ND	ND
E	ND	ND	ND
X	ND	ND	ND

**NOTES:**  
 Results are based on soil samples collected on November 20 and 21, 1995. TPH-G = total petroleum hydrocarbons as gasoline; TPH-D = total petroleum hydrocarbons as diesel; B = benzene; T = toluene; E = ethylbenzene; X = total xylenes; ppm = parts per million.



**HYDROCARBON CONCENTRATIONS IN SOIL**  
 November 20 and 21, 1995

USA Gas # 57  
 10700 MacArthur Boulevard  
 Oakland, California

**FIGURE 5**

**ALTON GEOSCIENCE**  
 Livermore, California

Source: Ron Archer, Civil Engineer, Inc.

TABLE 4

SOIL ANALYTICAL DATA  
FORMER USA STATION #57  
10700 MacARTHUR BOULEVARD  
OAKLAND, CALIFORNIA

Well ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl- benzene (ppm)	Total Xylene (ppm)
S-1	02/12/87	20.5	42	-	-	-	-	-
		20.5	16	-	-	-	-	-
S-2	02/12/87	24.5	600	-	-	-	-	-
B-1	02/28/95	5.5	ND	-	ND	ND	ND	ND
		9.5	44	-	0.12	ND	0.14	0.4
		13.0	540	55	2.6	10	7.5	48
		20.0	ND	-	0.012	0.016	ND	0.029
		25.0	3.9	-	0.048	0.14	0.062	0.37
		31.0	ND	-	ND	0.011	0.0057	0.045
		35.0	ND	-	0.014	0.018	0.012	0.079
40.5	ND	ND	ND	ND	ND	ND		
B-2	03/01/95	5.0	ND	-	ND	ND	ND	ND
		10.5	ND	-	ND	ND	ND	ND
		16.0	16	-	0.057	0.028	0.029	1.2
		21.0	110	-	0.96	0.41	0.33	1.5
		26.0	240	22	0.76	1.4	0.85	1.9
B-3	03/01/95	11.0	ND	-	ND	ND	ND	ND
		15.5	10	-	0.044	0.11	0.079	0.63
		20.5	15	1.3	0.041	0.37	0.15	1.1
B-4	03/02/95	3.0	ND	-	ND	ND	ND	ND
		6.0	ND	-	ND	ND	ND	ND
		12.0	ND	ND	ND	ND	ND	ND
B-5	03/02/95	5.5	ND	-	ND	ND	ND	ND
		12.0	ND	ND	ND	ND	ND	ND
B-6	03/02/95	4.0	33	5.3	0.093	0.065	0.33	2.0
		5.5	2.6	-	0.062	ND	0.030	0.047
		12.0	ND	-	ND	ND	ND	0.022

TABLE 4 (Continued)

SOIL ANALYTICAL DATA  
FORMER USA STATION #57  
10700 MacARTHUR BOULEVARD  
OAKLAND, CALIFORNIA

Well ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl- benzene (ppm)	Total Xylene (ppm)
B-7	03/02/95	3.5	ND	ND	ND	ND	ND	ND
		5.0	ND	-	ND	ND	ND	ND
		12.0	ND	-	ND	ND	ND	ND
B-8	03/02/95	3.0	17	-	0.012	0.021	0.12	0.16
		5.5	ND	ND	0.019	ND	0.050	ND
		12.0	2.0	-	0.042	ND	ND	0.016
MW-3	02/28/95	5.5	ND	-	ND	ND	ND	ND
		11.5	1.9	-	0.026	0.011	0.0061	0.019
		13.5	240	12	0.41	0.64	2.0	5.4
		15.5	110	-	0.37	3.8	1.5	10
		21.5	3.0	-	0.26	0.24	0.059	0.50
		24.5	ND	-	0.030	0.0069	0.0056	0.016
		29.5	ND	-	ND	0.0054	ND	0.0092
39.5	ND	-	ND	ND	ND	ND		
MW-4	11/21/95	10.0	ND	5.0	ND	ND	ND	ND
MW-5	11/21/95	10.0	ND	5.2	ND	ND	ND	ND
		15.0	ND	4.2	ND	ND	ND	ND
MW-6	11/21/95	10.0	ND	4.4	ND	ND	ND	ND
MW-7	11/21/95	10.0	ND	4.7	ND	ND	ND	ND
		15.0	ND	4.3	ND	ND	ND	ND
		20.0	25	8.7	0.071	0.11	0.043	0.1
MW-8	11/21/95	10.0	ND	5.5	ND	ND	ND	ND
		15.0	ND	5.1	ND	ND	ND	ND
		20.0	ND	4.5	ND	ND	ND	ND

TPH G Total petroleum hydrocarbons in the gasoline range

TPH D Total petroleum hydrocarbons in the diesel range

ppm Parts per million

ND Not detected at the method detection limit

- Not measured/not analyzed

Boring locations are presented in Alton Geo Sciences' "Supplementary Site Assessment Report" which are included in Appendix C.

11/21/95		MW-5	
TPHG	10'	15'	ND
B	ND	ND	ND

11/21/95		MW-4	
TPHG	10'	ND	ND
B	ND	ND	ND

11/21/95		MW-6	
TPHG	10'	ND	ND
B	ND	ND	ND

3/02/95		B-6		
TPHG	4'	5.5'	12'	ND
B	0.093	0.062	ND	ND

11/21/95		MW-7		
TPHG	10'	15'	20'	ND
B	ND	ND	25	0.071

3/02/95		B-5	
TPHG	5.5'	12'	ND
B	ND	ND	ND

2/12/87		C	
TPHG	20'	ND	ND
B	NA	NA	NA

3/02/95		B-4		
TPHG	3'	6'	12'	ND
B	ND	ND	ND	ND

3/02/95		B-7		
TPHG	3.5'	5'	12'	ND
B	ND	ND	ND	ND

2/12/87		D	
TPHG	10.5'	2	NA
B	NA	NA	NA

2/12/87		B	
TPHG	20'	4	NA
B	NA	NA	NA

2/12/87		S-2	
TPHG	24.5'	600	NA
B	NA	NA	NA

3/02/95		B-8		
TPHG	3'	5.5'	12'	2.0
B	0.012	0.019	0.042	ND

2/12/87		A	
TPHG	15'	16	NA
B	NA	NA	NA

2/12/87		S-1	
TPHG	20.5'	42	NA
B	NA	NA	NA

3/01/95		B-2				
TPHG	5'	10.5'	16'	21'	26'	ND
B	ND	ND	0.057	0.96	0.76	ND

3/01/95		B-3		
TPHG	11'	15.5'	20.5'	ND
B	ND	10	15	0.041

11/21/95		MW-8		
TPHG	10'	15'	20'	ND
B	ND	ND	ND	ND

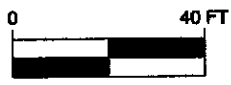
2/28/95		B-1							
TPHG	5.5'	9.5'	13'	20'	25'	31'	35'	40.5'	ND
B	ND	0.12	2.6	0.012	0.048	ND	0.014	ND	ND

2/28/95		MW-3							
TPHG	5.5'	11.5'	13.5'	15.5'	21.5'	24.5'	29.5'	39.5'	ND
B	ND	1.9	240	110	3.0	ND	ND	ND	ND
		0.026	0.41	0.37	0.26	0.030	ND	ND	

**LEGEND:**  
 ● MW-3 MONITORING WELL LOCATION  
 ● B-1 APPROXIMATE SOIL BORING LOCATION

**DATE SAMPLED**  
 2/28/95  
 SAMPLING DEPTH IN FEET BGS  
 TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN mg/Kg  
 BENZENE IN mg/Kg

ND NOT DETECTED (LABORATORY REPORTING LIMITS NOT AVAILABLE)  
 NA NOT ANALYZED FOR THIS CONSTITUENT



NOTE: MAP BASES ON SURVEY PREPARED BY RON ARCHER CIVIL ENGINEER INC. (DATED NOVEMBER 22, 1986) AND DRAWINGS PREPARED BY ALTON GEOSCIENCE AND WESTERN GEO-ENGINEERS.

**STRATUS**  
 ENVIRONMENTAL, INC.

**FORMER USA STATION #57**  
 10700 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA

**FIGURE**  
**4**

**SOIL CONCENTRATION MAP**

**PROJECT NO.**  
 2007-0057-01

USA 87, Soil Sampling.dwg  
 Mar 12, 2004  
 Rev.  
 JHP  
 USA 871/Verde/01